

### ABSTRACT

A method, apparatus, and computer program product are presented for automatically evaluating Bayesian network models. Operations performed comprise receiving a  
5 Bayesian Network (BN) model including evidence nodes and conclusion nodes that are linked with the evidence nodes by causal dependency links, and where the evidence nodes have evidence states and the conclusion nodes have conclusion states. The states of conclusion nodes are set to desired conclusion states and corresponding probabilities of occurrence of evidence states are determined by propagating these states down the  
10 causal dependency links. Thus, samples of most likely states of the evidence nodes are generated. Then, states of the evidence nodes are set corresponding to the samples of the evidence states. These states are propagated back up the causal dependency links to obtain probabilities of the resulting states of the conclusion nodes. Finally, a representation is outputted for the probabilities of the states of the conclusion nodes.

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